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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,986	11/05/2001	Fereidoon Heydari	01-S-045 (1678-47)	7945

30431 7590 01/26/2005

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EXAMINER	
RODRIGUEZ, GLENDA P	
ART UNIT	**PAPER NUMBER**
2651	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/993,986	HEYDARI ET AL.	
	Examiner	Art Unit	
	Glenda P. Rodriguez	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *4,8,9,11,14,19,23 and 26* is/are allowed.

6)☒ Claim(s) *1-3, 5-7, 10, 12, 13, 15, 16-18, 20-22, 24, 25, 27, 28 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 2, ~~7, 5~~ 5-7, 10, 12, 13, 15, 16, 20- 22, 24, 25, 27, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheung et al. (US Patent No. 6, 324, 030) in view of Sacks et al. (US Patent No. 6, 426, 845).

Regarding Claims 1, ~~and~~ 10 ~~and 18~~, Cheung et al. teach a position-burst demodulator/circuit, comprising:

> An input circuit operable to receive and square samples of a first servo position burst (Pat. No. 6, 324, 030; Col. 8, Lines 1-15. Cheung et al. teach using a plurality of samples.);
>
> An intermediate circuit coupled to the input circuit and operable to add the samples to generate a first sum (Pat. No. 6, 324, 030; Col. 8, Lines 15-32);
>
> And an output circuit coupled to the intermediate circuit and operable to calculate the square root of the first sum (Pat. No. 6, 324, 030; Col. 8, Lines 43-61. Cheung et al. further teach that a square root circuit can be added in the output.).

However, Cheung et al. does not explicitly teach wherein two servo samples are being used for the procedure. Sacks et al. teaches a demodulator/circuit in which two servo samples 202 and 206 (e.g. fields) are sampled, added and then its square root is calculated (Col. 7, L. 9-19 and

Col. 7, L. 52 to Col. 8, L. 65. Also see fig. 7 of Sacks et al.). It would have been obvious for a person of ordinary skill in the art, at the time the invention was made, to modify Cheung et al.'s invention with the teaching of Sacks et al. in order to control the position of the head with respect to the disk surface.

Method claims 16, 20 and 29 are drawn to the method of using the corresponding apparatus claimed in claims 1 and 10. Therefore method claims 16 and 20 correspond to apparatus claims 1, 10 and 28 and are rejected for the same reasons of obviousness as used above.

Regarding Claim 5, Cheung et al. teach a position-burst demodulator:

A first adder operable to receive first and second sets of samples of a first servo position burst, to add the samples in the first set together to generate a first sum, and to add the samples in the second set together to generate a second sum (Pat. No. 6, 324, 030; Col. 7, Lines 6-36. Cheung et al. teach that the samples are first added before being squared as disclosed in Col. 8, Lines 1-32);

A power circuit coupled to the first adder and operable to square the first sum and the second sum to respectively generate first and second squared sums (Pat. No. 6, 324, 030; Col. 8, Lines 1-32. Cheung et al. teach a circuit being coupled to the first adder that squares the samples.);

A second adder coupled to the squarer and operable to add the first and second squared sums to generate a first sum of squares (Col. 8, Lines 15-32);

And a root circuit coupled to the second adder and operable to calculate the square root of the first sum of squares (Pat. No. 6, 324, 030; Col. 8, Lines 47-54).

However, Cheung et al. does not explicitly teach wherein two servo samples are being used for the procedure. Sacks et al. teaches a demodulator/circuit in which two servo samples 202 and 206 (e.g. fields) are sampled, added and then its square root is calculated (Col. 7, L. 9-19 and Col. 7, L. 52 to Col. 8, L. 65. Also see fig. 7 of Sacks et al.). It would have been obvious for a person of ordinary skill in the art, at the time the invention was made, to modify Cheung et al.'s invention with the teaching of Sacks et al. in order to control the position of the head with respect to the disk surface.

Regarding Claim 12, Cheung et al. teach a circuit, comprising:

Receive fewer than ten samples per cycle of a first servo position burst (Col. 7, Lines 29-35. Cheung et al. teach receiving four samples.);

Receive fewer than ten samples per cycle of another servo position burst (Col. 7, Lines 29-35. Cheung et al. teach receiving four samples. It is obvious that it receives samples from more than one positional burst.);

And calculate a head-position error signal from the samples of the bursts such that the accuracy of the error signal is independent of the timing of the samples with respect to the bursts (Pat. No. 6, 324, 030; Col. 8, Lines 1-60. Cheung et al. teach calculating a PES signal from the first sampled signals as in Col. 7, Lines 1-36 of Cheung et al.).

However, Cheung et al. does not explicitly teach wherein two servo samples are being used for the procedure. Sacks et al. teaches a demodulator/circuit in which two servo samples 202 and 206 (e.g. fields) are sampled, added and then its square root is calculated (Col. 7, L. 9-19 and Col. 7, L. 52 to Col. 8, L. 65. Also see fig. 7 of Sacks et al.). It would have been obvious for a

person of ordinary skill in the art, at the time the invention was made, to modify Cheung et al.'s invention with the teaching of Sacks et al. in order to control the position of the head with respect to the disk surface.

Method claims 24 and 27 are drawn to the method of using the corresponding apparatus claimed in claim 12. Therefore method claims 24 and 27 correspond to apparatus claim 12 and is rejected for the same reasons of obviousness as used above.

Regarding Claim 15, Cheung et al. teach a disk drive, comprising:

> A data-storage disk having a surface, data tracks defined on the surface, the data tracks having respective centers, the data-storage disk also having servo wedges located in the tracks, each servo wedge including position bursts (Pat. No. 6, 324, 030; Col. 4, Lines 3-25. Cheung teaches servo sectors (i.e. wedge) in which positioning bursts are located in the servo sector.);
>
> a motor coupled to and operable to rotate the disk (It is known that the disk is rotated by a motor or spindle);
>
> a read head operable to generate a read signal that represents the position bursts (Pat. No. 6, 324, 030; Col. 6, Line 5-6);
>
> a read-head positioning circuit operable to move the read head toward the center of a data track in response to a position-error signal (Pat. No. 6, 324, 030; Col. 6, Lines 14-18. Cheung et al. teach a servo control system that controls the positioning of the read/write head.);
>
> And a servo circuit coupled to the read head and to the read-head positioning system, the servo circuit operable to sample the read signal fewer than ten times

per cycle of the position bursts, and calculate the position-error signal from the samples such that the accuracy of the position-error signal is independent of the timing of the samples with respect to the read signal (Col. 6, Lines 18-63 and Col. 9, Lines 1-9. Cheung et al. discloses a servo control system in which it controls the position of the head with respect to the track center. Cheung et al. further teach that this method eliminates error due to asynchronous sampling phase error, caused by the sampling clock (See Col. 6, Lines 40-45 of Cheung et al.)).

However, Cheung et al. does not explicitly teach wherein no more than two servo samples are being used for the procedure. Sacks et al. teaches a demodulator/circuit in which two servo samples 202 and 206 (e.g. fields) are sampled, added and then its square root is calculated (Col. 7, L. 9-19 and Col. 7, L. 52 to Col. 8, L. 65. Also see fig. 7 of Sacks et al.). It would have been obvious for a person of ordinary skill in the art, at the time the invention was made, to modify Cheung's invention with the teaching of Sacks et al. in order to control the position of the head with respect to the disk surface.

Regarding Claim 2, the combination of Cheung and Sacks et al. teach all the limitations of Claim 1. The combination further teaches wherein the first and second samples comprise consecutive samples (Col. 9, Lines 44-53 of Cheung et al. and Fig. 2, Elements 202 and 206 of Sacks et al.).

Regarding Claim 6, the combination of Cheung and Sacks et al. teach all the limitations of Claim 5. The combination further teach the first and second sets of samples together represent a string of samples; the samples in one of the first and second sets are even samples of the string;

and the samples in the other of the first and second sets are odd samples of the string (Pat. No. 6, 324, 030; Col. 8, Lines 1-13).

Regarding Claims 7, the combination of Cheung et al. and Sacks et al. teach all the limitations of Claims 5. The combination further teach wherein the first adder is operable to add the magnitudes of the samples in the first set together to generate the first sum and to add the magnitudes of the samples in the second set together to generate the second sum (Col. 7, Lines 29-35. Cheung et al. teach receiving four samples. It is obvious that it receives samples from more than one positional burst.).

Regarding Claims 13 and 25, the combination of Cheung et al. and Sacks et al. teach all the limitations of Claims 12 and 24, respectively. The combination further operable to generate the samples of the first and second servo position bursts (Pat. No. 6, 324, 030; Col. 7, Lines 29-35).

Regarding Claim 21, the combination of Cheung et al. and Sacks et al. teach all the limitations of Claim 20. The combination further teach generating one of the first and second sets of samples by sampling the first servo position burst every other sampling time (Col. 7, Lines 19-24. Cheung et al. teach that sampling is done at each sampling interval. It is obvious to a person of ordinary skill in the art that an interval is a predetermined window of time.); and generating the other of the first and second sets of samples by sampling the first servo position burst at the remaining sampling times (Col. 7, Lines 29-35. Cheung et al. teach receiving four samples. It is obvious that it receives samples from more than one positional burst in order for the sampling to be done for each servo burst.).

Regarding Claim 22, the combination of Cheung et al. and Sacks et al. teach all the limitations of Claim 20. The combination further teach: adding the samples in the first set comprises adding the magnitudes of the samples in the first set together to generate the first sum; and adding the samples in the second set comprises adding the magnitudes of the samples in the second set together to generate the second sum (Col. 7, Lines 29-35. Cheung et al. teach receiving four samples. It is obvious that it receives samples from more than one positional burst in order for the sampling to be done for each servo burst.).

2. Claims 3, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheung et al. and Sacks et al. as applied to claim 1 and 16, respectively above, and further in view of Patapoutian et al. (US Patent No. 5, 661, 760). Cheung et al. teach all the limitations of Claims 1 and 16. Cheung et al. further teach wherein the first and second samples comprise average samples. However, this feature is well known in the art as disclosed by Patapoutian et al., wherein it teaches samples being averaged for detecting positioning errors (Pat. No. 5, 661, 760; Col. 8, Lines 45-51). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Cheung et al.'s invention in order to simplify the samples.

Allowable Subject Matter

3. Claims 4, 8, 9, 11, 14, 19, 23 and 26 are allowed.

Regarding Claims 14 and 26, the reasons for allowance are in the Office Action dated March 11, 2004.

Regarding Claim 4, 11 and 19, the primary reason for allowance is the inclusion of the limitation wherein a difference circuit operable to calculate a difference between the square roots of the first and second sums.

Regarding Claims 8, 9 and 23, the primary reason for allowance is the inclusion of the limitation wherein a difference circuit operable to calculate a difference between the square roots of the first and second sums of squares.

Response to Arguments

4. Applicant's arguments, see Applicant's Amendment, filed 7/23/2004, with respect to the rejection(s)of claim(s) 1-3, 5-7, 10, 12, 13, 15, 16-18, 20-22, 24, 25, 27, 28 and 29 under Cheung et al. have been fully considered and are persuasive. However, upon further consideration, a new ground(s) of rejection is made in view of Cheung et al. and Sacks et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (703) 305-8411. The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (703) 305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gpr
January 19, 2005.

SINH TRAN
PRIMARY EXAMINER